

CLEAN COPY OF ALL CLAIMS

1. A scintillator detector for high energy radiation comprising:
a monocrystalline structure of cerium doped lutetium yttrium orthosilicate.
2. The crystal of Claim 1 having the general composition of $\text{Ce}_{2x}(\text{Lu}_{1-y}\text{Y}_y)_{2(1-x)}\text{SiO}_5$ where x = approximately 0.00001 to approximately 0.05 and y = approximately 0.0001 to approximately 0.9999.

CANCEL CLAIM 3.

4. The crystal of Claim 2 wherein x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.
5. A scintillation detector assembly comprising:
a cerium doped lutetium yttrium orthosilicate mono crystal; and,
a photon detector coupled to said crystal said crystal when exposed to a high energy gamma ray.

CANCEL CLAIM 6.

7. The detector assembly of Claim 5 wherein said mono crystal has the general composition of $\text{Ce}_{2x}(\text{Lu}_{1-y}\text{Y}_y)_{2(1-x)}\text{SiO}_5$ where x = approximately 0.00001 to approximately 0.05 and y = approximately 0.0001 to approximately 0.9999.

8. The detector assembly of Claim 7 where in x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.

9. The detector assembly of Claim 5 wherein said coupled photon detector is selected from at least one of a photomultiplier tube, a PIN diode and an APD(avalanche photo detector) diode

10. A method of detecting energy with a scintillation detector, comprising the steps of:
receiving radiation by a crystal comprising cerium doped lutetium yttrium orthosilicate;
detecting energy from a detector coupled to the crystal.

The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving gamma rays.

12. The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving x-rays.

The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving cosmic rays.

The method of claim 10, wherein the step of receiving radiation includes the step of:
receiving radiation by a monocrystalline.

The method of claim 10, wherein the step of detecting includes the step of:
detecting light with a photo detector coupled to the crystal.

The method of claim 15, wherein the step of detecting includes the step of:
detecting light with a photomultiplier tube coupled to the crystal.

The method of claim 15, wherein the step of detecting includes the step of:
detecting light with a PIN diode coupled to the crystal.

The method of claim 15, wherein the step of detecting includes the step of:
detecting light with a APD diode coupled to the crystal.

19. The method of claim 10, wherein the crystal includes a composition of $\text{Ce}_{2x}(\text{Lu}_{1-y}\text{Y}_y)_{2(1-x)}\text{SiO}_5$ where $x = \text{approximately } 0.00001 \text{ to approximately } 0.05$ and $y = \text{approximately } 0.0001 \text{ to approximately } 0.9999$.

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20. The method of claim 13, wherein x ranges from approximately 0.0001 to approximately 0.001 and y ranges from approximately 0.3 to approximately 0.8.
